

2011-01-04 Substitute_Sequence_Listing
SEQUENCE LISTING

<110> Feldmann, Kenneth
Pennell, Roger
Kwok, Shing
Dang, Van-Dinh
Zhang, Hongyu

<120> NUCLEOTIDE SEQUENCES AND POLYPEPTIDES ENCODED THEREBY USEFUL FOR
INCREASING PLANT SIZE AND INCREASING THE NUMBER AND SIZE OF LEAVES

<130> 2750-1573PUS1

<140> 10/572,827
<141> 2006-03-21

<150> PCT/US03/25997
<151> 2003-08-18

<160> 50

<170> PatentIn version 3.0

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<220>
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<222> (1)..(1453)
<223> ceres Seq. ID no. 12355477

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<213> Zea mays subsp. mays

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<223> ceres Seq. ID no. 12355478

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Gly Trp Thr Asp Glu Arg His Arg Leu Tyr Ile Ser Ser Met Glu Ala
35 40 45
Ser Phe Val Asp Gln Leu Tyr Asn His Gly Ser Arg Pro Arg Asn Ala
50 55 60
Asn Gly Thr Ala Phe Lys Ala Leu Arg Arg Glu Tyr Val Glu Tyr Glu
65 70 75 80
Lys Thr Asp Ala Pro Val Arg Arg Gly Ala Lys Cys Cys Gly Val Pro
85 90 95
Ala Asn Pro Trp Met Gln His Phe Arg Pro Arg Ser Asp Gly Gly Asn
100 105 110
Asn Ala Arg Gly Asp Gly Leu Gly Asp Ser Val Gly Asp Leu Glu Ser
115 120 125
Gly Thr Glu Ala Asn Arg Lys Ser Leu Ser Ala Ser His Gly Arg Glu
130 135 140
Arg Asp Ala Cys Glu Gly Glu Pro Gln Leu Leu His Glu Ser Arg Glu
145 150 155 160
Val Ser Asp Gln Asn Phe Ala Asp Asp Glu Ala Glu Ala Glu Thr Glu
165 170 175
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180 185 190

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<211> 163
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 <213> Zea mays subsp. mays

<220>
 <221> peptide
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 <223> ceres Seq. ID no. 12355479

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 35 40 45
 Glu Tyr Glu Lys Thr Asp Ala Pro Val Arg Arg Gly Ala Lys Cys Cys
 50 55 60
 Gly Val Pro Ala Asn Pro Trp Met Gln His Phe Arg Pro Arg Ser Asp
 65 70 75 80
 Gly Gly Asn Asn Ala Arg Gly Asp Gly Leu Gly Asp Ser Val Gly Asp
 85 90 95
 Leu Glu Ser Gly Thr Glu Ala Asn Arg Lys Ser Leu Ser Ala Ser His
 100 105 110
 Gly Arg Glu Arg Asp Ala Cys Glu Gly Glu Pro Gln Leu Leu His Glu
 115 120 125
 Ser Arg Glu Val Ser Asp Gln Asn Phe Ala Asp Asp Glu Ala Glu Ala
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 145 150 155 160
 Met Ile Asn

<210> 6
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 <212> DNA
 <213> Zea mays subsp. mays

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<221> peptide

<222> (1)..(147)

<223> ceres Seq. ID no. 12355480

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Glu Tyr Glu Lys Thr Asp Ala Pro Val Arg Arg Gly Ala Lys Cys Cys
35 40 45

Gly Val Pro Ala Asn Pro Trp Met Gln His Phe Arg Pro Arg Ser Asp
50 55 60

Gly Gly Asn Asn Ala Arg Gly Asp Gly Leu Gly Asp Ser Val Gly Asp
65 70 75 80

Leu Glu Ser Gly Thr Glu Ala Asn Arg Lys Ser Leu Ser Ala Ser His
85 90 95

Gly Arg Glu Arg Asp Ala Cys Glu Gly Glu Pro Gln Leu Leu His Glu
100 105 110

Ser Arg Glu Val Ser Asp Gln Asn Phe Ala Asp Asp Glu Ala Glu Ala
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Met Ile Asn
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<211> 1494

<212> DNA

<213> Zea mays subsp. mays

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<221> misc_feature

<222> (1)..(1494)

<223> ceres Seq. ID no. 12410516

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agagcgcacc	tgaattccac	cgaaatccgc	cacggtagtt	cttgcctagg	tgtgtcgttg	240
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gcctcagtgg gcgaccatga gtcgggtact caggcaagcc gcaagagccc ttcagtgtct 420
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gtctctgatc aaaattttgc tgacgatgag gctgaagctg aaacagaatc aatgaaagca 540
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<210> 10
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<213> Zea mays subsp. mays

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<223> ceres Seq. ID no. 12410517

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35 40 45
Phe Val Asp Gln Leu Tyr Asn His Gly Asn His Pro His Asp Ala Asn
50 55 60
Gly Ala Gly Phe Lys Val Leu Arg Arg Gly Val Trp Glu Tyr Ile Glu
65 70 75 80
Tyr Glu Lys Thr Ser Ala Pro Val Arg Ser Gly Ala Lys Cys Cys Val
85 90 95
Pro Ala Asn Pro Trp Ile Arg His Phe Arg Pro Arg Asp Cys Gly Ser
100 105 110
Asn Ala Gln Ser Asp Ala Val Glu Ala Ser Val Gly Asp His Glu Ser
115 120 125
Gly Thr Gln Ala Ser Arg Lys Ser Pro Ser Val Ser His Gly Arg Glu
130 135 140
Arg Gly Ala Cys Lys Gly Glu Pro Gln Ile Leu His Glu Ser Thr Glu
145 150 155 160
Val Ser Asp Gln Asn Phe Ala Asp Asp Glu Ala Glu Ala Glu Thr Glu
165 170 175
Ser Met Lys Ala Cys Lys Lys Arg Arg Leu Ser Arg Ala Leu His Ser

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190

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<210> 11
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<210> 12
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<212> PRT
<213> Zea mays subsp. mays

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<223> ceres Seq. ID no. 12410518

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20 25 30
His Asp Ala Asn Gly Ala Gly Phe Lys Val Leu Arg Arg Gly Val Trp
35 40 45
Glu Tyr Ile Glu Tyr Glu Lys Thr Ser Ala Pro Val Arg Ser Gly Ala
50 55 60
Lys Cys Cys Val Pro Ala Asn Pro Trp Ile Arg His Phe Arg Pro Arg
65 70 75 80
Asp Cys Gly Ser Asn Ala Gln Ser Asp Ala Val Glu Ala Ser Val Gly
85 90 95
Asp His Glu Ser Gly Thr Gln Ala Ser Arg Lys Ser Pro Ser Val Ser

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 His Gly Arg Glu Arg Gly Ala Cys Lys Gly Glu Pro Gln Ile Leu His
 115 120 125
 Glu Ser Thr Glu Val Ser Asp Gln Asn Phe Ala Asp Asp Glu Ala Glu
 130 135 140
 Ala Glu Thr Glu Ser Met Lys Ala Cys Lys Lys Arg Arg Leu Ser Arg
 145 150 155 160
 Ala Leu His Ser Gly Ala Glu
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<210> 13
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 <212> DNA
 <213> Zea mays subsp. mays

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 atcgagtatg agaagaccag tgcccctgtg cgaagtggg ctaaagtctg cgtccctgca 180
 aatccttgga tccggcattt caggccacgt gactgcggta gtaacgcaca gagtgacgcg 240
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 acagaggtct ctgatcaaaa ttttgctgac gatgaggctg aagctgaaac agaataatg 420
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 <212> PRT
 <213> Zea mays subsp. mays

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 <222> (1)..(157)
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 20 25 30
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 35 40 45
 Pro Val Arg Ser Gly Ala Lys Cys Cys Val Pro Ala Asn Pro Trp Ile
 50 55 60
 Arg His Phe Arg Pro Arg Asp Cys Gly Ser Asn Ala Gln Ser Asp Ala

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Glu	Pro	Gln	Ile	Leu	His	Glu	Ser	Thr	Glu	Val	Ser	Asp	Gln	Asn	Phe	
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<212>	DNA
<213>	Brassica napus

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aactccctcg	gtgcgctcgg	ctccaaaaac	aacaaggata	ctgtcggacc	atcgagaagg		240
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 <212> PRT
 <213> Brassica napus

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 Glu Asp Thr Pro Thr Glu Trp Thr Asp Glu Lys His Ser Leu Tyr Leu
 35 40 45
 Lys Ser Met Glu Ala Ser Phe Val Asp Gln Leu Tyr Asn Ser Leu Gly
 50 55 60
 Ala Leu Gly Ser Lys Asn Asn Lys Asp Thr Val Gly Pro Ser Arg Arg
 65 70 75 80
 Phe Gly Asp Gly Gly Lys Pro Ser Glu Glu Gln Val
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<210> 18
 <211> 198
 <212> DNA
 <213> Brassica napus

<400> 18
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<210> 19
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 <213> Brassica napus

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 <223> ceres Seq. ID no. 4788144

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 1 5 10 15
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20 25 30
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 Gln Val
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<210> 20
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 <213> Brassica napus

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<210> 21
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 <212> PRT
 <213> Brassica napus

<220>
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 <222> (1)..(62)
 <223> ceres Seq. ID no. 4788145

<400> 21
 Met Lys Ile Arg Leu Gln Asn Gly Pro Met Arg Ser Ile Val Cys Ile
 1 5 10 15
 Leu Asn Gln Trp Lys Leu Pro Ser Leu Ile Ser Cys Thr Thr Pro Ser
 20 25 30
 Val Arg Ser Ala Pro Lys Thr Thr Arg Ile Leu Ser Asp His Arg Glu
 35 40 45
 Gly Ser Val Met Val Glu Asn Leu Leu Lys Asn Arg Tyr Glu
 50 55 60

<210> 22
 <211> 486
 <212> DNA
 <213> Brassica napus

<220>
 <221> misc_feature
 <222> (1)..(486)
 <223> ceres Seq. ID no. 4796909

2011-01-04 Substitute_Sequence_Listing

<400> 22
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 agcccaagct ccgacgattc ttcttctgta ggggaagaga cgacttcttc aatgtattct 180
 gcgaggaatg aagatacgcc tacagaatgg accgatgaga agcatagttt gtatcttaaa 240
 tcaatggaag cttccttcgt tgatcagctg tacaactccc tcggtgcgct cggctccaaa 300
 aacaacaagg atactgtcgg accatcgaga aggttcggtg atggtggaaa accttctgaa 360
 gaacagaaga tgaatgtgag gcagcctgag tatcgtctca atggaagaca cggtcgctgc 420
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 acagat 486

<210> 23
 <211> 393
 <212> DNA
 <213> Brassica napus

<400> 23
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 gaagagacga cttcttcaat gtattctgct aggaatgaag atacgcctac agaatggacc 120
 gatgagaagc atagtttgta tcttaaatca atggaagctt ctttcgttga tcagctgtac 180
 aactccctcg gtgcgctcgg ctccaaaaac aacaaggata ctgtcggacc atcgagaagg 240
 ttcggtgatg gtggaaaacc ttctgaagaa cagaagatga atgtgaggca gcctgagtat 300
 cgtctcaatg gaagacacgg tcgtcgtctt cactagtttc ttaggagtc atggatcaag 360
 cactataagc cttcaccaaa gtccctaaca gat 393

<210> 24
 <211> 131
 <212> PRT
 <213> Brassica napus

<220>
 <221> peptide
 <222> (1)..(131)
 <223> ceres Seq. ID no. 4796910

<400> 24
 Met Val Gly Asp Tyr Arg Glu Asn Tyr Ser Pro Ser Ser Asp Asp Ser
 1 5 10 15
 Ser Ser Val Gly Glu Glu Thr Thr Ser Ser Met Tyr Ser Ala Arg Asn
 20 25 30
 Glu Asp Thr Pro Thr Glu Trp Thr Asp Glu Lys His Ser Leu Tyr Leu

2011-01-04 Substitute_Sequence_Listing

35

40

45

Lys Ser Met Glu Ala Ser Phe Val Asp Gln Leu Tyr Asn Ser Leu Gly
50 55 60
Ala Leu Gly Ser Lys Asn Asn Lys Asp Thr Val Gly Pro Ser Arg Arg
65 70 75 80
Phe Gly Asp Gly Gly Lys Pro Ser Glu Glu Gln Lys Met Asn Val Arg
85 90 95
Gln Pro Glu Tyr Arg Leu Asn Gly Arg His Gly Arg Arg Ser His Glu
100 105 110
Phe Leu Arg Ser Pro Trp Ile Lys His Tyr Lys Pro Ser Pro Lys Ser
115 120 125
Leu Thr Asp
130

<210> 25
<211> 315
<212> DNA
<213> Brassica napus

<400> 25
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tatcttaaat caatggaagc ttccttcgtt gatcagctgt acaactccct cgggtgcgctc 120
ggctccaaaa acaacaagga tactgtcggg ccatcgagaa gggtcggtga tgggtgaaaa 180
ccttctgaag aacagaagat gaatgtgagg cagcctgagt atcgtctcaa tggaagacac 240
ggtcgtcgct ctcacgagtt tcttaggagt ccatggatca agcactataa gccttcacca 300
aagtccttaa cagat 315

<210> 26
<211> 105
<212> PRT
<213> Brassica napus

<220>
<221> peptide
<222> (1)..(105)
<223> ceres Seq. ID no. 4796911

<400> 26
Met Tyr Ser Ala Arg Asn Glu Asp Thr Pro Thr Glu Trp Thr Asp Glu
1 5 10 15
Lys His Ser Leu Tyr Leu Lys Ser Met Glu Ala Ser Phe Val Asp Gln
20 25 30
Leu Tyr Asn Ser Leu Gly Ala Leu Gly Ser Lys Asn Asn Lys Asp Thr
35 40 45
Val Gly Pro Ser Arg Arg Phe Gly Asp Gly Gly Lys Pro Ser Glu Glu
50 55 60

2011-01-04 Substitute_Sequence_Listing

Gln Lys Met Asn Val Arg Gln Pro Glu Tyr Arg Leu Asn Gly Arg His
65 70 75 80
Gly Arg Arg Ser His Glu Phe Leu Arg Ser Pro Trp Ile Lys His Tyr
85 90 95
Lys Pro Ser Pro Lys Ser Leu Thr Asp
100 105

<210> 27
<211> 243
<212> DNA
<213> Brassica napus

<400> 27
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aacaaggata ctgtcggacc atcgagaagg ttcggtgatg gtggaaaacc ttctgaagaa 120
cagaagatga atgtgaggca gcctgagtat cgtctcaatg gaagacacgg tcgtcgctct 180
cacgagtttc ttaggagtcc atggatcaag cactataagc cttcaccaaa gtcctaaca 240
gat 243

<210> 28
<211> 81
<212> PRT
<213> Brassica napus

<220>
<221> peptide
<222> (1)..(81)
<223> ceres Seq. ID no. 4796912

<400> 28
Met Glu Ala Ser Phe Val Asp Gln Leu Tyr Asn Ser Leu Gly Ala Leu
1 5 10 15
Gly Ser Lys Asn Asn Lys Asp Thr Val Gly Pro Ser Arg Arg Phe Gly
20 25 30
Asp Gly Gly Lys Pro Ser Glu Glu Gln Lys Met Asn Val Arg Gln Pro
35 40 45
Glu Tyr Arg Leu Asn Gly Arg His Gly Arg Arg Ser His Glu Phe Leu
50 55 60
Arg Ser Pro Trp Ile Lys His Tyr Lys Pro Ser Pro Lys Ser Leu Thr
65 70 75 80
Asp

<210> 29

2011-01-04 Substitute_Sequence_Listing

<211> 1014
<212> DNA
<213> Arabidopsis thaliana

<220>
<221> misc_feature
<222> (1)..(1014)
<223> ceres Seq. ID no. 12321174

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<400> 29
ctctctctct taaagctctc ttctttggct ctttcgaaga agaaccattt ttatttccta 60
agagagacga cggagttctt ttctaaagca cgggagagga ggagaagcaa cgatggagaa 120
tgattgcacg gtgaatattg tctctctgga gaaggatcgc gatgtttcgg aggcgtcggc 180
tgaatctcag agcgaagtcga ctctttcgaa ctgcgtcgat tccggtgtta cggctgagac 240
ctctcgttct gatgctgatt ccaaactgga tgaatgtact gcttggacga atgagaaaca 300
caactcatat cttgattatt tagagagctc gtttgttagg caattatact ccttgcttgg 360
aggtgggact cagagacttt ctagaactcg tgatgtgcag tctaactctc ataaatcagc 420
tgatcagttt accgtcctac aaaatggttg ctggcagaag gttaactttg gaaagaaaca 480
atcttgtttg gagacttcat ctgagtttcg ttttcacaga aattcattga gaaataagcc 540
tgaaaattcc aacggaaatt acaccatggg aactactgtc caaggagatg tgttatgtca 600
tgacgaaacc aaacactcag aggcgtcagg gcagaatttc agagaagaag aagaagaaga 660
agagaagggg gaggtgagca aaaaacgaga aagagaagca aataacgatg atagttcatt 720
gaaggaggat caggttgtgc cggtaaggat ggtgaagccc agaacgtgaa agcattagga 780
agtgtagatg aaatactatg aatagagata aagaaataga agaaggtgtg gttacgaatg 840
tgagagaggt tttgtttgtt gtatagcgtg aggctaaaga gagccttcct tataaaggga 900
tccaatggga tatggaaata ggattggtgt ttgttttcgt taaattttgt ctaatgttaa 960
ctaggggaaa agttatctga tagtattagc atcttatggc aattttattc tttt 1014

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<210> 30
<211> 654
<212> DNA
<213> Arabidopsis thaliana

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<400> 30
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gcgtcggctg aatctcagag cgagtcgact ctttcgaact cgctcgattc cgggtgttacg 120
gctgagacct ctcgttctga tgctgattcc aaactggatg aatgtactgc ttggacgaat 180
gagaaacaca actcatatct tgattattta gagagctcgt ttgttaggca attatactcc 240
ttgcttggag gtgggactca gagactttct agaactcgtg atgtgcagtc taactctcat 300
aaatcagctg atcagtttac cgtcctacaa aatggttgct ggcagaaggt taactttgga 360

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2011-01-04 Substitute_Sequence_Listing

aagaaacaat cttgttttga gacttcatct gagtttcgtt ttcacagaaa ttcattgaga	420
aataagcctg aaaattccaa cggaattac accatgggaa ctactgtcca aggagatgtg	480
ttatgtcatg acgaaaccaa acactcagag gcgtcagggc agaatttcag agaagaagaa	540
gaagaagaag agaagggaga ggtgagcaaa aaacgagaaa gagaagcaaa taacgatgat	600
agttcattga aggaggatca ggttgtgccg gtaaggatgg tgaagcccag aacg	654

<210> 31
 <211> 218
 <212> PRT
 <213> Arabidopsis thaliana

<220>
 <221> peptide
 <222> (1)..(218)
 <223> ceres Seq. ID no. 12321175

<400> 31
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 20 25 30
 Asn Ser Leu Asp Ser Gly Val Thr Ala Glu Thr Ser Arg Ser Asp Ala
 35 40 45
 Asp Ser Lys Leu Asp Glu Cys Thr Ala Trp Thr Asn Glu Lys His Asn
 50 55 60
 Ser Tyr Leu Asp Tyr Leu Glu Ser Ser Phe Val Arg Gln Leu Tyr Ser
 65 70 75 80
 Leu Leu Gly Gly Gly Thr Gln Arg Leu Ser Arg Thr Arg Asp Val Gln
 85 90 95
 Ser Asn Ser His Lys Ser Ala Asp Gln Phe Thr Val Leu Gln Asn Gly
 100 105 110
 Cys Trp Gln Lys Val Asn Phe Gly Lys Lys Gln Ser Cys Leu Glu Thr
 115 120 125
 Ser Ser Glu Phe Arg Phe His Arg Asn Ser Leu Arg Asn Lys Pro Glu
 130 135 140
 Asn Ser Asn Gly Asn Tyr Thr Met Gly Thr Thr Val Gln Gly Asp Val
 145 150 155 160
 Leu Cys His Asp Glu Thr Lys His Ser Glu Ala Ser Gly Gln Asn Phe
 165 170 175
 Arg Glu Glu Glu Glu Glu Glu Lys Gly Glu Val Ser Lys Lys Arg
 180 185 190
 Glu Arg Glu Ala Asn Asn Asp Asp Ser Ser Leu Lys Glu Asp Gln Val
 195 200 205

2011-01-04 Substitute_Sequence_Listing

Val Pro Val Arg Met Val Lys Pro Arg Thr
210 215

<210> 32
<211> 1027
<212> DNA
<213> Arabidopsis thaliana

<220>
<221> misc_feature
<222> (1)..(1027)
<223> ceres Seq. ID no. 12323601

<400> 32
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tctccacaaa gataagccaa caatggttgg tgattacaga ggacgcttta gtagccgtcg 120
tttctccgac gactctgacg attctttccga cgatgcttct tccgtggagg gagagaccac 180
ttctttccatg tactctgcgg ggaaagagta tatggaaaca gaatggacta atgagaagca 240
tagtttatat cttaaactta tggaagcttc attcgtagat cagttatata actcgctcgg 300
agctctcggg aagaacgaga atgtatccga atcaacgagg ttcggtagcg gtagaaaacc 360
gtctcaagaa cagttcaagg ttcttcatga tggtttcttg cagaagatta atgtgaaaca 420
acctgaacat cggattaacg gaaggcacgg tggtaatctt catgagtttc ttaggagtcc 480
atggattaag cattataaac ctttagtaaa gacacaaatc ccggtaacgg atgagcccga 540
aaatcaagtt gtttagcagct ctaatgggaa gaagggaata tgcagctctg gctcagcctc 600
tagtctcaag cagctaagct ctcatctcgg tgaccacgac caaatcagcg ttggagaagc 660
agaggtatcg gatcagaact ttgttaacga aggaataaaa ggcgaaaacg gaagctcgaa 720
gaagatgaag acggtgatga tgagtgaatc gtcgagtacc gatcagggtt ttccactcaa 780
taagctcttg caacatgacg taaatttgaa gtctgtttct tgagagggtca gatggtgaag 840
ctttatatga ggagagaatt ttgtaatgta tatatatattg cataacttat aagtcaaatt 900
tactatcctt agttacaagt ttcttcatca tatatcccta actataaata tatttatatg 960
ctcatgtgag tggattcatt tgtactgtaa aacccttaga aagacgtcaa attagtattt 1020
gatggtc 1027

<210> 33
<211> 819
<212> DNA
<213> Arabidopsis thaliana

<400> 33
gatattttgt ttctctcttt ctctctgata tttttcattt tctttcttct ctctctctct 60
ctccacaaag ataagccaac aatgggttgg gattacagag gacgcttttag tagccgtcgt 120

2011-01-04 Substitute_Sequence_Listing

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ttctccgacg actctgacga ttcttccgac gatgcttctt ccgtggaggg agagaccact 180
tcttccatgt actctgcggg gaaagagtat atggaaacag aatggactaa tgagaagcat 240
agtttatatc ttaaattctat ggaagcttca ttcgtagatc agttatataa ctcgctcgga 300
gctctcggga agaacgagaa tgtatccgaa tcaacgaggt tcggtagcgg tagaaaaccg 360
tctcaagaac agttcaaggt tcttcatgat ggtttctggc agaagattaa tgtgaaacaa 420
cctgaacatc ggattaacgg aaggcacggt ggtaattctc atgagtttct taggagtcca 480
tgattaagc attataaacc tttagtaaag acacaaatcc cggtaacgga tgagcccgaa 540
aatcaagttg ttagcagctc taatgggaag aagggaatat gcagctctgg ctgagcctct 600
agtctcaagc agctaagctc tcattcgctg gaccacgacc aaatcagcgt tggagaagca 660
gaggtatcgg atcagaactt tgtaacgaa ggaataaaag gcgaaaacgg aagctcgaag 720
aagatgaaga cggatgatgat gagtgaatcg tcgagtaccg atcaggttgt tccactcaat 780
aagctcttgc aacatgacgt aaatttgaag tctgtttct 819

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<210> 34

<211> 273

<212> PRT

<213> Arabidopsis thaliana

<220>

<221> peptide

<222> (1)..(273)

<223> ceres Seq. ID no. 12323602

<400> 34

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Asp Ile Leu Phe Leu Ser Phe Ser Leu Ile Phe Phe Ile Phe Phe Phe
1      5      10     15
Phe Ser Leu Ser Leu His Lys Asp Lys Pro Thr Met Val Gly Asp Tyr
20     25     30
Arg Gly Arg Phe Ser Ser Arg Arg Phe Ser Asp Asp Ser Asp Asp Ser
35     40     45
Ser Asp Asp Ala Ser Ser Val Glu Gly Glu Thr Thr Ser Ser Met Tyr
50     55     60
Ser Ala Gly Lys Glu Tyr Met Glu Thr Glu Trp Thr Asn Glu Lys His
65     70     75     80
Ser Leu Tyr Leu Lys Ser Met Glu Ala Ser Phe Val Asp Gln Leu Tyr
85     90     95
Asn Ser Leu Gly Ala Leu Gly Lys Asn Glu Asn Val Ser Glu Ser Thr
100    105    110
Arg Phe Gly Ser Gly Arg Lys Pro Ser Gln Glu Gln Phe Lys Val Leu
115    120    125
His Asp Gly Phe Trp Gln Lys Ile Asn Val Lys Gln Pro Glu His Arg
130    135    140

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2011-01-04 Substitute_Sequence_Listing

Ile Asn Gly Arg His Gly Gly Asn Ser His Glu Phe Leu Arg Ser Pro
145 150 155 160
Trp Ile Lys His Tyr Lys Pro Leu Val Lys Thr Gln Ile Pro Val Thr
165 170 175
Asp Glu Pro Glu Asn Gln Val Val Ser Ser Ser Asn Gly Lys Lys Gly
180 185 190
Ile Cys Ser Ser Gly Ser Ala Ser Ser Leu Lys Gln Leu Ser Ser His
195 200 205
Ser Arg Asp His Asp Gln Ile Ser Val Gly Glu Ala Glu Val Ser Asp
210 215 220
Gln Asn Phe Val Asn Glu Gly Ile Lys Gly Glu Asn Gly Ser Ser Lys
225 230 235 240
Lys Met Lys Thr Val Met Met Ser Glu Ser Ser Ser Thr Asp Gln Val
245 250 255
Val Pro Leu Asn Lys Leu Leu Gln His Asp Val Asn Leu Lys Ser Val
260 265 270

Ser

<210> 35
<211> 738
<212> DNA
<213> Arabidopsis thaliana

<400> 35
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tcttccgacg atgcttcttc cgtggaggga gagaccactt cttccatgta ctctgcgggg 120
aaagagtata tggaacaga atggactaat gagaagcata gtttatatct taaatctatg 180
gaagcttcac tcgtagatca gttatataac tcgctcggag ctctcgggaa gaacgagaat 240
gtatccgaat caacgagggt cggtagcggg agaaaaccgt ctcaagaaca gttcaagggt 300
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aggcacgggt gtaattctca tgagtttctt aggagtccat ggattaagca ttataaacct 420
ttagtaaaga cacaaatccc ggtaacggat gagcccgaat atcaagttgt tagcagctct 480
aatgggaaga agggaatatg cagctctggc tcagcctcta gtctcaagca gctaagctct 540
cattcgcgtg accacgacca aatcagcgtt ggagaagcag aggtatcgga tcagaacttt 600
gttaacgaag gaataaaagg cgaaaacgga agctcgaaga agatgaagac ggtgatgatg 660
agtgaatcgt cgagtaccga tcagggttgtt ccactcaata agctcttgca acatgacgta 720
aatttgaagt ctgtttct 738

<210> 36
<211> 246
<212> PRT
<213> Arabidopsis thaliana

2011-01-04 Substitute_Sequence_Listing

<220>
 <221> peptide
 <222> (1)..(246)
 <223> ceres Seq. ID no. 12323603

<400> 36
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 20 25 30
 Thr Ser Ser Met Tyr Ser Ala Gly Lys Glu Tyr Met Glu Thr Glu Trp
 35 40 45
 Thr Asn Glu Lys His Ser Leu Tyr Leu Lys Ser Met Glu Ala Ser Phe
 50 55 60
 Val Asp Gln Leu Tyr Asn Ser Leu Gly Ala Leu Gly Lys Asn Glu Asn
 65 70 75 80
 Val Ser Glu Ser Thr Arg Phe Gly Ser Gly Arg Lys Pro Ser Gln Glu
 85 90 95
 Gln Phe Lys Val Leu His Asp Gly Phe Trp Gln Lys Ile Asn Val Lys
 100 105 110
 Gln Pro Glu His Arg Ile Asn Gly Arg His Gly Gly Asn Ser His Glu
 115 120 125
 Phe Leu Arg Ser Pro Trp Ile Lys His Tyr Lys Pro Leu Val Lys Thr
 130 135 140
 Gln Ile Pro Val Thr Asp Glu Pro Glu Asn Gln Val Val Ser Ser Ser
 145 150 155 160
 Asn Gly Lys Lys Gly Ile Cys Ser Ser Gly Ser Ala Ser Ser Leu Lys
 165 170 175
 Gln Leu Ser Ser His Ser Arg Asp His Asp Gln Ile Ser Val Gly Glu
 180 185 190
 Ala Glu Val Ser Asp Gln Asn Phe Val Asn Glu Gly Ile Lys Gly Glu
 195 200 205
 Asn Gly Ser Ser Lys Lys Met Lys Thr Val Met Met Ser Glu Ser Ser
 210 215 220
 Ser Thr Asp Gln Val Val Pro Leu Asn Lys Leu Leu Gln His Asp Val
 225 230 235 240
 Asn Leu Lys Ser Val Ser
 245

<210> 37
 <211> 633
 <212> DNA
 <213> Arabidopsis thaliana
 <400> 37

2011-01-04 Substitute_Sequence_Listing

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gggaagaacg agaatgtatc cgaatcaacg aggttcggta gcggtagaaa accgtctcaa	180
gaacagttca aggttcttca tgatggtttc tggcagaaga ttaatgtgaa acaacctgaa	240
catcggatta acggaaggca cggtggaat tctcatgagt ttcttaggag tccatggatt	300
aagcattata aacctttagt aaagacacaa atcccggtaa cggatgagcc cgaaaatcaa	360
gttgtttagca gctctaattg gaagaaggga atatgcagct ctggctcagc ctctagtctc	420
aagcagctaa gctctcattc gcgtgaccac gaccaaata gcgttgagga agcagaggta	480
tcggatcaga actttgttaa cgaaggaata aaaggcgaaa acggaagctc gaagaagatg	540
aagacggtga tgatgagtga atcgtcgagt accgatcagg ttgttccact caataagctc	600
ttgcaacatg acgtaaattt gaagtctggt tct	633

<210> 38
 <211> 211
 <212> PRT
 <213> Arabidopsis thaliana

<220>
 <221> peptide
 <222> (1)..(211)
 <223> ceres Seq. ID no. 12323604

<400> 38
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 20 25 30
 Leu Tyr Asn Ser Leu Gly Ala Leu Gly Lys Asn Glu Asn Val Ser Glu
 35 40 45
 Ser Thr Arg Phe Gly Ser Gly Arg Lys Pro Ser Gln Glu Gln Phe Lys
 50 55 60
 Val Leu His Asp Gly Phe Trp Gln Lys Ile Asn Val Lys Gln Pro Glu
 65 70 75 80
 His Arg Ile Asn Gly Arg His Gly Gly Asn Ser His Glu Phe Leu Arg
 85 90 95
 Ser Pro Trp Ile Lys His Tyr Lys Pro Leu Val Lys Thr Gln Ile Pro
 100 105 110
 Val Thr Asp Glu Pro Glu Asn Gln Val Val Ser Ser Ser Asn Gly Lys
 115 120 125
 Lys Gly Ile Cys Ser Ser Gly Ser Ala Ser Ser Leu Lys Gln Leu Ser
 130 135 140
 Ser His Ser Arg Asp His Asp Gln Ile Ser Val Gly Glu Ala Glu Val
 145 150 155 160

2011-01-04 Substitute_Sequence_Listing

Ser Asp Gln Asn Phe Val Asn Glu Gly Ile Lys Gly Glu Asn Gly Ser
165 170 175
Ser Lys Lys Met Lys Thr Val Met Met Ser Glu Ser Ser Ser Thr Asp
180 185 190
Gln Val Val Pro Leu Asn Lys Leu Leu Gln His Asp Val Asn Leu Lys
195 200 205
Ser Val Ser
210

<210> 39
<211> 960
<212> DNA
<213> Arabidopsis thaliana

<220>
<221> misc_feature
<222> (1)..(960)
<223> ceres Seq. ID no. 13491409

<400> 39
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ctccgatgac tctgacgatt cttccgacga tgcttcttcc gtggagggag agaccacttc 180
ttccatgtac tctgcgggga aagagtatat ggaaacagaa tggactaatg agaagcatag 240
tttatactct aaatctatgg aagcttcatt cgtagatcag ttatataact cgctcggagc 300
tctcgggaag aacgagaatg tatccgaatc aacgagggtc ggtagcggta gaaaaccgtc 360
tcaagaacag ttcaagggtc ttcatgatgg tttctggcag aagattaatg tgaaacaacc 420
tgaacatcgg attaacggaa ggcacggtgg taattctcat gagtttctta ggagtccatg 480
gattaagcat tataaacctt tagtaaagac acaaatcccg gtaacggatg agcccgaaaa 540
tcaagttggt agcagctcta atgggaagaa gggaatatgc agctctggct cagcctctag 600
tctcaagcag ctaagctctc attcgcgtga ccacgaccaa atcagcgttg gagaagcaga 660
ggtatcggat cagaactttg ttaacgaagg aataaaaggc gaaaacggaa gctcgaagaa 720
gatgaagacg gtgatgatga gtgaatcgtc gagtaccgat caggttgttc cactcaataa 780
actcttgcaa catgacgtaa atttgaagtc tgtttcttga gaggtcagat ggtgaagctt 840
tatatgagga gagaattttg taatgtatat atatttgcac aacttataag tcaaatttac 900
tatccttagt tacaagtttc ttcatcatat atccctaact ataaatatat ttatatgccc 960

<210> 40
<211> 816
<212> DNA
<213> Arabidopsis thaliana

2011-01-04 Substitute_Sequence_Listing

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<400> 40
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cacaaagata agccaacaat ggttggtgat tacagaggac gcttttagtag ccgtcgtttc      120
tccgatgact ctgacgattc ttccgacgat gcttcttccg tggagggaga gaccacttct      180
tccatgtact ctgcggggaa agagtatatg gaaacagaat ggactaatga gaagcatagt      240
ttatatctta aatctatgga agcttcattc gtagatcagt tatataactc gctcggagct      300
ctcgggaaga acgagaatgt atccgaatca acgaggttcg gtagcggtag aaaaccgtct      360
caagaacagt tcaaggttct tcatgatggt ttctggcaga agattaatgt gaaacaacct      420
gaacatcgga ttaacggaag gcacggtggt aattctcatg agtttcttag gagtccatgg      480
attaagcatt ataaaccttt agtaaagaca caaatcccgg taacggatga gcccgaaaat      540
caagttgtta gcagctctaa tgggaagaag ggaatatgca gctctggctc agcctctagt      600
ctcaagcagc taagctctca ttgcggtgac caccacaaa tcagcgttgg agaagcagag      660
gtatcggatc agaactttgt taacgaagga ataaaaggcg aaaacggaag ctcgaagaag      720
atgaagacgg tgatgatgag tgaatcgtcg agtaccgatc aggttggtcc actcaataaa      780
ctcttgcaac atgacgtaaa tttgaagtct gtttct      816

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<210> 41
<211> 272
<212> PRT
<213> Arabidopsis thaliana

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<220>
<221> peptide
<222> (1)..(272)
<223> ceres Seq. ID no. 13491410

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<400> 41
Phe Leu Phe Leu Ser Phe Ser Leu Ile Phe Phe Ile Phe Phe Phe Phe
1          5          10          15
Ser Leu Ser Leu His Lys Asp Lys Pro Thr Met Val Gly Asp Tyr Arg
20        25        30
Gly Arg Phe Ser Ser Arg Arg Phe Ser Asp Asp Ser Asp Asp Ser Ser
35        40        45
Asp Asp Ala Ser Ser Val Glu Gly Glu Thr Thr Ser Ser Met Tyr Ser
50        55        60
Ala Gly Lys Glu Tyr Met Glu Thr Glu Trp Thr Asn Glu Lys His Ser
65        70        75        80
Leu Tyr Leu Lys Ser Met Glu Ala Ser Phe Val Asp Gln Leu Tyr Asn
85        90        95
Ser Leu Gly Ala Leu Gly Lys Asn Glu Asn Val Ser Glu Ser Thr Arg

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100					105					110					
Phe	Gly	Ser	Gly	Arg	Lys	Pro	Ser	Gln	Glu	Gln	Phe	Lys	Val	Leu	His
	115						120					125			
Asp	Gly	Phe	Trp	Gln	Lys	Ile	Asn	Val	Lys	Gln	Pro	Glu	His	Arg	Ile
	130					135					140				
Asn	Gly	Arg	His	Gly	Gly	Asn	Ser	His	Glu	Phe	Leu	Arg	Ser	Pro	Trp
	145					150					155				160
Ile	Lys	His	Tyr	Lys	Pro	Leu	Val	Lys	Thr	Gln	Ile	Pro	Val	Thr	Asp
				165					170					175	
Glu	Pro	Glu	Asn	Gln	Val	Val	Ser	Ser	Ser	Asn	Gly	Lys	Lys	Gly	Ile
			180					185					190		
Cys	Ser	Ser	Gly	Ser	Ala	Ser	Ser	Leu	Lys	Gln	Leu	Ser	Ser	His	Ser
		195					200					205			
Arg	Asp	His	Asp	Gln	Ile	Ser	Val	Gly	Glu	Ala	Glu	Val	Ser	Asp	Gln
	210					215					220				
Asn	Phe	Val	Asn	Glu	Gly	Ile	Lys	Gly	Glu	Asn	Gly	Ser	Ser	Lys	Lys
	225					230					235				240
Met	Lys	Thr	Val	Met	Met	Ser	Glu	Ser	Ser	Ser	Thr	Asp	Gln	Val	Val
				245				250						255	
Pro	Leu	Asn	Lys	Leu	Leu	Gln	His	Asp	Val	Asn	Leu	Lys	Ser	Val	Ser
			260					265					270		

<210> 42
 <211> 738
 <212> DNA
 <213> Arabidopsis thaliana

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aaagagtata tggaacaga atggactaat gagaagcata gtttatatct taaatctatg	180
gaagcttcac tcgtagatca gttatataac tcgctcggag ctctcgggaa gaacgagaat	240
gtatccgaat caacgagggt cggtagcggg agaaaaccgt ctcaagaaca gttcaagggt	300
cttcatgatg gtttctggca gaagattaat gtgaaacaac ctgaacatcg gattaacgga	360
aggcacggtg gtaattctca tgagtttctt aggagtccat ggattaagca ttataaacct	420
ttagtaaaga cacaaatccc ggtaacggat gagcccgaat atcaagttgt tagcagctct	480
aatgggaaga agggaaatag cagctctggc tcagcctcta gtctcaagca gctaagctct	540
cattcgcgtg accacgacca aatcagcgtt ggagaagcag aggtatcgga tcagaacttt	600
gttaacgaag gaataaaagg cgaaaacgga agctcgaaga agatgaagac ggtgatgatg	660
agtgaatcgt cgagtaccga tcaggttggt ccactcaata aactcttgca acatgacgta	720

aatttgaagt ctgtttct

738

<210> 43
 <211> 246
 <212> PRT
 <213> Arabidopsis thaliana

<220>
 <221> peptide
 <222> (1)..(246)
 <223> ceres Seq. ID no. 13491411

<400> 43
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 1 5 10 15
 Asp Ser Asp Asp Ser Ser Asp Asp Ala Ser Ser Val Glu Gly Glu Thr
 20 25 30
 Thr Ser Ser Met Tyr Ser Ala Gly Lys Glu Tyr Met Glu Thr Glu Trp
 35 40 45
 Thr Asn Glu Lys His Ser Leu Tyr Leu Lys Ser Met Glu Ala Ser Phe
 50 55 60
 Val Asp Gln Leu Tyr Asn Ser Leu Gly Ala Leu Gly Lys Asn Glu Asn
 65 70 75 80
 Val Ser Glu Ser Thr Arg Phe Gly Ser Gly Arg Lys Pro Ser Gln Glu
 85 90 95
 Gln Phe Lys Val Leu His Asp Gly Phe Trp Gln Lys Ile Asn Val Lys
 100 105 110
 Gln Pro Glu His Arg Ile Asn Gly Arg His Gly Gly Asn Ser His Glu
 115 120 125
 Phe Leu Arg Ser Pro Trp Ile Lys His Tyr Lys Pro Leu Val Lys Thr
 130 135 140
 Gln Ile Pro Val Thr Asp Glu Pro Glu Asn Gln Val Val Ser Ser Ser
 145 150 155 160
 Asn Gly Lys Lys Gly Ile Cys Ser Ser Gly Ser Ala Ser Ser Leu Lys
 165 170 175
 Gln Leu Ser Ser His Ser Arg Asp His Asp Gln Ile Ser Val Gly Glu
 180 185 190
 Ala Glu Val Ser Asp Gln Asn Phe Val Asn Glu Gly Ile Lys Gly Glu
 195 200 205
 Asn Gly Ser Ser Lys Lys Met Lys Thr Val Met Met Ser Glu Ser Ser
 210 215 220
 Ser Thr Asp Gln Val Val Pro Leu Asn Lys Leu Leu Gln His Asp Val
 225 230 235 240
 Asn Leu Lys Ser Val Ser
 245

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<210> 44
 <211> 633
 <212> DNA
 <213> Arabidopsis thaliana

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 tatcttaaatt ctatggaagc ttcatctgta gatcagttat ataactcgct cggagctctc 120
 gggaagaacg agaatgtatc cgaatcaacg aggttcggta gcggtagaaa accgtctcaa 180
 gaacagttca aggttcttca tgatggtttc tggcagaaga ttaatgtgaa acaacctgaa 240
 catcggatta acggaaggca cggtggtaat tctcatgagt ttcttaggag tccatggatt 300
 aagcattata aacctttagt aaagacacaa atcccggtaa cggatgagcc cgaaaatcaa 360
 gttgttagca gctctaattg gaagaaggga atatgcagct ctggctcagc ctctagtctc 420
 aagcagctaa gctctcattc gcgtgaccac gaccaaata gcgttgagga agcagaggta 480
 tcggatcaga actttgttaa cgaaggaata aaaggcgaaa acggaagctc gaagaagatg 540
 aagacggtga tgatgagtga atcgtcgagt accgatcagg ttgttccact caataaactc 600
 ttgcaacatg acgtaaattt gaagtctgtt tct 633

<210> 45
 <211> 211
 <212> PRT
 <213> Arabidopsis thaliana

<220>
 <221> peptide
 <222> (1)..(211)
 <223> ceres Seq. ID no. 13491412

<400> 45
 Met Tyr Ser Ala Gly Lys Glu Tyr Met Glu Thr Glu Trp Thr Asn Glu
 1 5 10 15
 Lys His Ser Leu Tyr Leu Lys Ser Met Glu Ala Ser Phe Val Asp Gln
 20 25 30
 Leu Tyr Asn Ser Leu Gly Ala Leu Gly Lys Asn Glu Asn Val Ser Glu
 35 40 45
 Ser Thr Arg Phe Gly Ser Gly Arg Lys Pro Ser Gln Glu Gln Phe Lys
 50 55 60
 Val Leu His Asp Gly Phe Trp Gln Lys Ile Asn Val Lys Gln Pro Glu
 65 70 75 80
 His Arg Ile Asn Gly Arg His Gly Gly Asn Ser His Glu Phe Leu Arg
 85 90 95
 Ser Pro Trp Ile Lys His Tyr Lys Pro Leu Val Lys Thr Gln Ile Pro
 100 105 110
 Val Thr Asp Glu Pro Glu Asn Gln Val Val Ser Ser Ser Asn Gly Lys
 115 120 125

2011-01-04 Substitute_Sequence_Listing

Lys Gly Ile Cys Ser Ser Gly Ser Ala Ser Ser Leu Lys Gln Leu Ser
130 135 140
Ser His Ser Arg Asp His Asp Gln Ile Ser Val Gly Glu Ala Glu Val
145 150 155 160
Ser Asp Gln Asn Phe Val Asn Glu Gly Ile Lys Gly Glu Asn Gly Ser
165 170 175
Ser Lys Lys Met Lys Thr Val Met Met Ser Glu Ser Ser Ser Thr Asp
180 185 190
Gln Val Val Pro Leu Asn Lys Leu Leu Gln His Asp Val Asn Leu Lys
195 200 205
Ser Val Ser
210

<210> 46
<211> 1031
<212> DNA
<213> Artificial Sequence

<220>
<223> clone nucleotide 486033

<220>
<221> misc_feature
<222> (609)..(609)
<223> n is a, c, g, or t

<400> 46
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tgttgcagtt cagtttgcac cctgagctct ctctggacc agccgagatt tctctctctg 120
cgcattctta attcatcttc gtcgagagga gctgttcctc ttctttgccg cctcgaatct 180
gggactggtc ggttttcttg atccctgctg cctgtcgggt tctcgagagg tgtaaaatcc 240
aatggagggt gtgtcatcgt tgaaccagcc gttgatcaac gacgaccggc agcccgaggc 300
cagcagtatc gccaagggtg atcaaattca aggcctgttg tcgggtgaat ggacaaatga 360
gcggcacagc tcgtacataa gtcctatgga ggcattcttc gtggagcaac tccgtagtgg 420
ttccaaggcc atccaggagg gcttgtgcca gagcatgagg attccgaggg atgatgctcg 480
cagccatgac gtccctgaga gtccgtgggt ggtggtgagg cgtttcaggc cacgcggtgt 540
ccaccatggc gatggaatgg aagtggaacc tttggtcgat ggttatggat caggtactga 600
cacggcccng agagaagggtc cggaccacg caagatagcg aaggcttctg ctattattga 660
agtcacggac cagaattttc ctgaggaggg gattcaatcc agtaacggtg catgcaagag 720
acagaaatct actcctggca atgcatcaaa tggccagggt acttaacaag atagtggaag 780

2011-01-04 Substitute_Sequence_Listing

ccaagccatg ccctctctga agccttcagg aggccatggg ggaaacgaga cttgtctgca 840
 gtactacgtg atgacaggtc gtgctgcagc tgcaagtagt ttggcttacc aaaatatgat 900
 atcgtcgtcc tttctgcggt gtggagagta gaatatgcat atccacatct gcagagagca 960
 ccggttctct tcttcttggt gctgttacta ttttgtgcca tggagcaaat ttatttggtg 1020
 aatttgagct g 1031

<210> 47
 <211> 174
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> clone peptide 486033

<220>
 <221> misc_feature
 <222> (123)..(123)
 <223> Xaa can be any naturally occurring amino acid

<400> 47

Met Glu Gly Val Ser Ser Leu Asn Gln Pro Leu Ile Asn Asp Asp Arg
 1 5 10 15

Gln Pro Val Pro Ser Ser Ile Ala Lys Gly Asp Gln Ile Gln Gly Leu
 20 25 30

Leu Ser Gly Glu Trp Thr Asn Glu Arg His Ser Ser Tyr Ile Ser Ser
 35 40 45

Met Glu Ala Ser Phe Val Glu Gln Leu Arg Ser Gly Ser Lys Ala Ile
 50 55 60

Gln Glu Gly Leu Cys Gln Ser Met Arg Ile Pro Arg Asp Asp Ala Arg
 65 70 75 80

Ser His Asp Val Pro Glu Ser Pro Trp Val Val Val Arg Arg Phe Arg
 85 90 95

Pro Arg Gly Val His His Gly Asp Gly Met Glu Val Glu Pro Leu Val
 100 105 110

Asp Gly Tyr Gly Ser Gly Thr Asp Thr Ala Xaa Arg Glu Gly Pro Asp
 115 120 125

Pro Arg Lys Ile Ala Lys Ala Ser Ala Ile Ile Glu Val Thr Asp Gln
 130 135 140

2011-01-04 Substitute_Sequence_Listing

Asn Phe Pro Glu Glu Gly Ile Gln Ser Ser Asn Gly Ala Cys Lys Arg
145 150 155 160

Gln Lys Ser Thr Pro Gly Asn Ala Ser Asn Gly Gln Gly Thr
165 170

<210> 48
<211> 210
<212> PRT
<213> Artificial Sequence

<220>
<223> Consensus sequence derived from various organisms

<220>
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<222> (2)..(2)
<223> Xaa is Glu or Lys

<220>
<221> misc_feature
<222> (3)..(3)
<223> Xaa is a tiny amino acid, specifically, alanine, glycine, serine or threonine

<220>
<221> misc_feature
<222> (5)..(5)
<223> Xaa is Thr or Pro

<220>
<221> misc_feature
<222> (7)..(8)
<223> Xaa is a tiny amino acid, specifically, alanine, glycine, serine or threonine

<220>
<221> misc_feature
<222> (9)..(9)
<223> Xaa is Met or Gly

<220>
<221> misc_feature
<222> (10)..(10)
<223> Xaa is Tyr or Ile

<220>
<221> misc_feature
<222> (11)..(11)
<223> Xaa is a tiny amino acid, specifically, alanine, glycine, serine or threonine

<220>
<221> misc_feature
<222> (12)..(12)
<223> Xaa is Ala or Lys

<220>
<221> misc_feature
<222> (14)..(14)

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<223> Xaa is Lys or Asn

<220>
<221> misc_feature
<222> (15)..(15)
<223> Xaa is Glu or Arg

<220>
<221> misc_feature
<222> (16)..(16)
<223> Xaa is Tyr or Val

<220>
<221> misc_feature
<222> (17)..(17)
<223> Xaa is an aliphatic residue, specifically, isoleucine, valine,
leucine, or methionine

<220>
<221> misc_feature
<222> (18)..(18)
<223> Xaa is any amino acid

<220>
<221> misc_feature
<222> (19)..(19)
<223> Xaa is a tiny amino acid, specifically, alanine, glycine,
serine or threonine

<220>
<221> misc_feature
<222> (20)..(23)
<223> At least 1 but as many as 4 of the Xaa amino acids can be present;
Xaa is any amino acid

<220>
<221> misc_feature
<222> (26)..(26)
<223> Xaa is Asn or Asp

<220>
<221> misc_feature
<222> (28)..(28)
<223> Xaa is a positively charged residue, specifically, lysine, arginine,
or histidine

<220>
<221> misc_feature
<222> (30)..(30)
<223> Xaa is any amino acid

<220>
<221> misc_feature
<222> (31)..(31)
<223> Xaa is Leu or Ser

<220>
<221> misc_feature
<222> (33)..(33)
<223> Xaa is an aliphatic residue, specifically, isoleucine, valine,
leucine, or methionine

<220>

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2011-01-04 Substitute_Sequence_Listing

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<221> misc_feature
<222> (34)..(34)
<223> Xaa is Lys or Ser

<220>
<221> misc_feature
<222> (42)..(42)
<223> Xaa is any negatively charged amino acid, specifically,
      aspartic acid or glutamic acid

<220>
<221> misc_feature
<222> (45)..(74)
<223> Any one or all of the Xaa amino acids can either be present or
      absent; Xaa is any amino acid

<220>
<221> misc_feature
<222> (76)..(76)
<223> Xaa is Val or Ala

<220>
<221> misc_feature
<222> (77)..(77)
<223> Xaa is an aliphatic residue, specifically, isoleucine, valine,
      leucine, or methionine

<220>
<221> misc_feature
<222> (78)..(79)
<223> Xaa is any amino acid

<220>
<221> misc_feature
<222> (80)..(80)
<223> Xaa is Gly or Glu

<220>
<221> misc_feature
<222> (81)..(82)
<223> Xaa is any amino acid

<220>
<221> misc_feature
<222> (83)..(83)
<223> Xaa is Gln or Glu

<220>
<221> misc_feature
<222> (84)..(102)
<223> At least 9 but as many as 19 of the Xaa amino acids can be
      present; Xaa is any amino acid

<220>
<221> misc_feature
<222> (103)..(103)
<223> Xaa is His or Cys

<220>
<221> misc_feature
<222> (104)..(104)
<223> Xaa is any amino acid

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<222> (105)..(105)
<223> Xaa is Phe or Val

<220>
<221> misc_feature
<222> (106)..(106)
<223> Xaa is Leu or Pro

<220>
<221> misc_feature
<222> (107)..(107)
<223> Xaa is any amino acid

<220>
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<222> (108)..(108)
<223> Xaa is Ser or Asn

<220>
<221> misc_feature
<222> (111)..(112)
<223> Any one or ll of the Xaa amino acids can either be present or
absent; Xaa is any amino acid

<220>
<221> misc_feature
<222> (113)..(113)
<223> Xaa is an aliphatic residue, specifically, isoleucine, valine,
leucine, or methionine

<220>
<221> misc_feature
<222> (114)..(114)
<223> Xaa is any amino acid

<220>
<221> misc_feature
<222> (115)..(115)
<223> Xaa is a positively charged residue, specifically, lysine,
arginine, or histidine

<220>
<221> misc_feature
<222> (116)..(116)
<223> Xaa is any aromatic residue, specifically, phenylalanine,
tyrosine, or tryptophan

<220>
<221> misc_feature
<222> (117)..(117)
<223> Xaa is a positively charged residue, specifically, lysine,
arginine, or histidine

<220>
<221> misc_feature
<222> (119)..(126)
<223> Any one or all of the Xaa amino acids can either be present
or absent; Xaa is any amino acid

<220>
<221> misc_feature

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<222> (127)..(127)
 <223> Xaa is a tiny amino acid, specifically, alanine, glycine, serine or threonine

 <220>
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 <222> (129)..(130)
 <223> Xaa is any amino acid

 <220>
 <221> misc_feature
 <222> (131)..(131)
 <223> Xaa is Glu or Asn

 <220>
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 <222> (132)..(139)
 <223> Xaa is any amino acid

 <220>
 <221> misc_feature
 <222> (140)..(140)
 <223> Xaa is Gly

 <220>
 <221> misc_feature
 <222> (141)..(146)
 <223> Any one or all of the xaa amino acids can either be present or absent; Xaa is any amino acid

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 <221> misc_feature
 <222> (148)..(148)
 <223> Xaa is Gly or Pro

 <220>
 <221> misc_feature
 <222> (149)..(149)
 <223> Xaa is a tiny amino acid, specifically, alanine, glycine, serine or threonine

 <220>
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 <222> (150)..(150)
 <223> Xaa is any amino acid

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 <222> (151)..(151)
 <223> Xaa is a tiny amino acid, specifically, alanine, glycine, serine or threonine

 <220>
 <221> misc_feature
 <222> (152)..(153)
 <223> Xaa is any amino acid

 <220>
 <221> misc_feature
 <222> (154)..(154)
 <223> Xaa is a positively charged residue, specifically, lysine, arginine, or histidine

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<222> (155)..(171)
<223> At least 6 but as many as 17 of the xaa amino acids can be
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<220>
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<222> (172)..(172)
<223> Xaa is Gln or Lys

<220>
<221> misc_feature
<222> (173)..(173)
<223> Xaa is an aliphatic residue, specifically, isoleucine, valine,
      leucine, or methionine

<220>
<221> misc_feature
<222> (174)..(176)
<223> Xaa is any amino acid

<220>
<221> misc_feature
<222> (177)..(177)
<223> Xaa is Glu or Ser

<220>
<221> misc_feature
<222> (178)..(180)
<223> At least 1 but as many as 3 of the xaa amino acids can be
      present; Xaa is any amino acid

<220>
<221> misc_feature
<222> (183)..(183)
<223> Xaa is a tiny amino acid, specifically, alanine, glycine,
      serine or threonine

<220>
<221> misc_feature
<222> (188)..(189)
<223> Xaa is any amino acid

<220>
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<222> (190)..(190)
<223> Xaa is any negatively charged amino acid, specifically,
      aspartic acid or glutamic acid

<220>
<221> misc_feature
<222> (191)..(191)
<223> Xaa is Gly or Glu

<220>
<221> misc_feature
<222> (192)..(192)
<223> Xaa is Ile or Ala

<220>
<221> misc_feature
<222> (193)..(193)

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<223> xaa is any amino acid
 <220>
 <221> misc_feature
 <222> (194)..(194)
 <223> xaa is a tiny amino acid, specifically, alanine, glycine, serine or threonine
 <220>
 <221> misc_feature
 <222> (195)..(195)
 <223> xaa is Glu or Ser
 <220>
 <221> misc_feature
 <222> (196)..(196)
 <223> xaa is Asn or Thr
 <220>
 <221> misc_feature
 <222> (197)..(197)
 <223> xaa is Gly or Glu
 <220>
 <221> misc_feature
 <222> (198)..(198)
 <223> xaa is a tiny amino acid, specifically, alanine, glycine, serine or threonine
 <220>
 <221> misc_feature
 <222> (199)..(199)
 <223> xaa is any amino acid
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 <222> (201)..(202)
 <223> xaa is any amino acid
 <220>
 <221> misc_feature
 <222> (204)..(204)
 <223> xaa is any amino acid
 <220>
 <221> misc_feature
 <222> (205)..(205)
 <223> xaa is Val or Arg
 <220>
 <221> misc_feature
 <222> (206)..(206)
 <223> xaa is Met or Arg
 <220>
 <221> misc_feature
 <222> (207)..(207)
 <223> xaa is an aliphatic residue, specifically, isoleucine, valine, leucine, or methionine
 <220>
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 <222> (209)..(209)

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<223> Xaa is Glu or Arg

<220>

<221> misc_feature

<222> (210)..(210)

<223> Xaa is a tiny amino acid, specifically, alanine, glycine, serine or threonine

<400> 48

Val Xaa Xaa Glu Xaa Thr Xaa Xaa Xaa Xaa Xaa Xaa Gly Xaa Xaa Xaa
1 5 10 15

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Trp Thr Xaa Glu Xaa His Xaa Xaa Tyr
20 25 30

Xaa Xaa Ser Met Glu Ala Ser Phe Val Xaa Gln Leu Xaa Xaa Xaa Xaa
35 40 45

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
50 55 60

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Lys Xaa Xaa Xaa Xaa Xaa
65 70 75 80

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
85 90 95

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Pro Trp Xaa Xaa
100 105 110

Xaa Xaa Xaa Xaa Xaa Pro Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Asp
115 120 125

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
130 135 140

Xaa Xaa Ser Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
145 150 155 160

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
165 170 175

Xaa Xaa Xaa Xaa Glu Val Xaa Asp Gln Asn Phe Xaa Xaa Xaa Xaa Xaa
180 185 190

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Lys Xaa Xaa Lys Xaa Xaa Xaa Xaa Ser
195 200 205

Xaa Xaa

210

<210> 49
 <211> 241
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Consensus sequence derived from various organisms

<220>
 <221> misc_feature
 <222> (1)..(1)
 <223> Xaa is Ser or Glu

<220>
 <221> misc_feature
 <222> (2)..(2)
 <223> Xaa is a tiny amino acid, specifically, alanine, glycine, serine or threonine

<220>
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 <222> (3)..(10)
 <223> Xaa is any amino acid

<220>
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 <222> (11)..(11)
 <223> Xaa is Glu or Gly

<220>
 <221> misc_feature
 <222> (12)..(16)
 <223> At least 2 but as many as 5 of the xaa amino acids can be present;
 Xaa is any amino acid

<220>
 <221> misc_feature
 <222> (17)..(17)
 <223> Xaa is a tiny amino acid, specifically, alanine, glycine, serine or threonine

<220>
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 <222> (18)..(31)
 <223> At least 11 but as many as 14 of the xaa amino acids can be present;
 Xaa is any amino acid

<220>
 <221> misc_feature
 <222> (34)..(34)
 <223> Xaa is Asn or Asp

<220>
 <221> misc_feature
 <222> (36)..(36)
 <223> Xaa is a positively charged residue, specifically, lysine, arginine,
 or histidine

<220>
 <221> misc_feature
 <222> (38)..(39)
 <223> Xaa is any amino acid

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<220>
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<222> (41)..(41)
<223> Xaa is an aliphatic residue, specifically, isoleucine, valine,
      leucine, or methionine

<220>
<221> misc_feature
<222> (42)..(42)
<223> Xaa is any amino acid

<220>
<221> misc_feature
<222> (43)..(43)
<223> Xaa is Ser or Tyr

<220>
<221> misc_feature
<222> (44)..(44)
<223> Xaa is an aliphatic residue, specifically, isoleucine, valine,
      leucine, or methionine

<220>
<221> misc_feature
<222> (46)..(46)
<223> Xaa is a tiny amino acid, specifically, alanine, glycine, serine
      or threonine

<220>
<221> misc_feature
<222> (50)..(50)
<223> Xaa is any amino acid

<220>
<221> misc_feature
<222> (52)..(52)
<223> Xaa is Lys or Ser

<220>
<221> misc_feature
<222> (53)..(135)
<223> At least 8 but as many as 83 of the Xaa amino acids can be present;
      Xaa is any amino acid

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<221> misc_feature
<222> (136)..(136)
<223> Xaa is Pro or Glu

<220>
<221> misc_feature
<222> (137)..(137)
<223> Xaa is any aromatic residue, specifically, phenylalanine, tyrosine,
      and tryptophan

<220>
<221> misc_feature
<222> (138)..(141)
<223> At least 2 but as many as 4 of the Xaa amino acids can be present;
      Xaa is any amino acid

<220>
<221> misc_feature

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<222> (142)..(142)
 <223> Xaa is a positively charged residue, specifically, lysine, arginine, or histidine

<220>
 <221> misc_feature
 <222> (143)..(231)
 <223> At least 9 but as many as 89 of the Xaa amino acids can be present;
 Xaa is any amino acid

<220>
 <221> misc_feature
 <222> (233)..(234)
 <223> Xaa is any amino acid

<220>
 <221> misc_feature
 <222> (235)..(235)
 <223> Xaa is Asp or Gly

<220>
 <221> misc_feature
 <222> (239)..(240)
 <223> Xaa is any amino acid

<220>
 <221> misc_feature
 <222> (241)..(241)
 <223> Xaa is any negatively charged amino acid, specifically, aspartic acid or glutamic acid

<400> 49

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
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Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Trp
 20 25 30

Thr Xaa Glu Xaa His Xaa Xaa Tyr Xaa Xaa Xaa Xaa Glu Xaa Ser Phe
 35 40 45

Val Xaa Gln Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
 50 55 60

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
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Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
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Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
 100 105 110

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
 115 120 125

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Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
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Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
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Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
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Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
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Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
 195 200 205

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
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Xaa Xaa Xaa Xaa Xaa Xaa Xaa Glu Xaa Xaa Xaa Gln Asn Phe Xaa Xaa
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Xaa

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 <212> DNA
 <213> Artificial Sequence

<220>
 <223> oligo primer used in the generation of labeled probes for
 hybridization from first-strand cDNA

<400> 50
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